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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/049,270

06/27/2002

Hui Zhong

Q68281

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02/23/2006

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EXAMINER

DINH, TUAN T

ART UNIT

PAPER NUMBER

2841

DATE MAILED: 02/23/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/049,270

Applicant(s)

ZHONG ET AL

Examiner

Tuan T. Dinh

Art Unit

2841

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 02 December 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 9,31-34 and 36-38 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 9 and 36 is/are allowed.
- 6) ☒ Claim(s) 31,33,37 and 38 is/are rejected.
- 7) ☒ Claim(s) 32 and 34 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 09/23/05.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

## DETAILED ACTION

### ***Claim Rejections - 35 USC § 103***

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 31, 33 are rejected under 35 U.S.C. 103(a) as being unpatentable over Reed (U.S. Patent 4,211,603) in view of Kenji et al. (JP 05-39345) submitted by applicant.

As to claim 31, Reed discloses a multilayered printed circuit board as shown in figures 1-4 comprising:

a conductor circuit (12) and a resin insulating layer (22) serially formed on a substrate (16) in alternate fashion and in repetition; and

a solder resist layer (46) formed as an outermost layer, see figure 4.

Reed does not disclose said solder resist layer (46) containing a P-atom containing epoxy resin, the P-atom containing epoxy resin having bivalent phosphoric acid residue, and having epoxy group in both terminals of the P-atom containing epoxy resin.

Kenji et al. teaches a phosphorus containing epoxy resin as shown in formulas 1-2.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to employ a solder resist composition containing a P-atom containing epoxy resin as taught by Kenji et al. to modify the solder resist of Reed for the purpose of providing a heat resistance suitable on the surface of the PCB.

As to claim 33, Reed discloses all of the limitation of the claimed invention, except for a P-atom containing epoxy resin having monovalent phosphoric acid residue in one terminal of the P-atom containing epoxy resin, and an epoxy group in the other terminal of the P-atom containing epoxy.

Kenji et al. teaches a phosphorus containing epoxy resin as shown in formulas 1-2.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to employ a solder resist composition containing a P-atom containing epoxy resin as taught by Kenji et al. to modify the solder resist of Reed for the purpose of providing a heat resistance suitable on the surface of the PCB.

3. Claims 37-38 are rejected under 35 U.S.C. 103(a) as being unpatentable over Reed ('603) in view of Kenji (JP 05-39345) as applied to claims 31 and 33 above, and further in view of Myamura ('378).

Regarding claims 37-38, Reed and Kenji disclose all of the limitations of the claimed invention, except for the solder resist containing at least one member selected from the group consisting of silicon, Al, and Mg compounds.

Myamura shows a solder resist containing a silica or alumina, see column 5, lines 39-45.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to use a teaching of Myamura employed in the circuit board of Reed and Kenji in order to provide heat resistances, and surface hardness suitable on a surface of a circuit board.

***Allowable Subject Matter***

4. Claims 32, and 34 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

5. Claims 9 and 36 are allowed.

The following is an examiner's statement of reasons for allowance: the references cited disclose a multilayered PCB comprising a conductor circuit, a resin insulating layer, a solder resist layer, and some other claim elements. However, they do not disclose or render obvious in combination of the PCB comprising the solder resist having an elastomer component being separated in micro-phase as to form an island in-sea structure after curing in the solder resist.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably

accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

### ***Response to Arguments***

Applicant's arguments filed 12/02/05 have been fully considered but they are not persuasive.

Applicant argues:

(a) The combination of Reed in view of Kenji does not disclose "said solder resist layer containing a P-atom containing epoxy resin, the P-atom containing epoxy resin having bivalent phosphoric acid residue, and having epoxy group in both terminals of the P-atom containing epoxy resin" and "a P-atom containing epoxy resin having monovalent phosphoric acid residue in one terminal of the P-atom containing epoxy resin, and an epoxy group in the other terminal of the P-atom containing epoxy"

Examiner disagrees because Kenji as disclosed an epoxy resin having formulas (1)- (2) that teaches the epoxy resin containing a P-atom containing epoxy resin, that means the epoxy resin containing P-atom in a polymer of resin polymer, further the P-atom containing epoxy resin having bivalent phosphoric acid residue, which are R1 and R2 containing a hexagon polymer connected to the P-atom, and two epoxy groups connected to both terminals of the P-atom containing epoxy resin (on left side and right side of the formula 1).

Since Kenji does teach (as explained as above) the P-atom containing epoxy resin having bivalent phosphoric acid residue, then it does include a monovalent phosphoric acid residue.

Thus, the examiner believes the rejection based on the combination of Reed in view of Kenji is proper.

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tuan T. Dinh whose telephone number is 571-272-1929. The examiner can normally be reached on M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kammie Cuneo can be reached on 571-272-1957. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Tuan Dinh  
February 07, 2006.